DEPARTMENT OF THE AIR FORCE
HEADQUARTERS SPACE AND MISSILE SYSTEMS CENTER (AFSPC)
LOS ANGELES AIR FORCE BASE, CALIFORNIA

21 JUL 04

MEMORANDUM FOR SEE DISTRIBUTION

FROM: SMC/CC
2420 Vela Way, Suite 1866
El Segundo, CA 90245-4659

SUBJECT: Implementation Plan for Rideshare Missions on EELV DoD Assets

References: (a) AFI 10-1202(I), AR 70-43, OPNAVINST 3913.1A, Space Test Program (STP) Management, dtd 1 Apr 98
(b) AFSPC/XO Memorandum, SUBJ: Auxiliary Payload Approval Policy, dtd 12 May 04
(c) Deputy Secretary of Defense Memorandum, SUBJ: Space Test Program Management and Funding Policy, dtd 8 Jul 02

1. Purpose

This implementation plan defines the process for adding additional payloads onto EELV DoD assets (See Attachment 2). This implementation plan does not apply to EELV commercial missions. It is in response to increasing demand for responsive access to space for small Research and Development (R&D) as well as operational payloads proposed by National Aeronautics and Space Administration (NASA), Defense Advanced Research Projects Agency (DARPA), the National Reconnaissance Office (NRO), and others. This plan will define the process and provide a "roadmap" for prospective customers to access this launch capability.

2. Definitions

a. Rideshare Missions are defined as missions where an auxiliary (piggyback or secondary) payload has been added to the mission in addition to the primary payload.

b. Auxiliary Payloads (APLs) are defined as either a Secondary Payload or a Piggyback Payload as follows:

(1) Secondary Payloads are defined as Independent spacecraft that are physically separate from the primary payload, but which share the same launch vehicle. In most cases, APLs do not drive the launch vehicle requirements.

(2) Piggyback payloads are defined as instruments or packages physically attached to a host – typically the primary payload spacecraft -- but which function as a separate space experiment. Piggybacks rely on the host for services and resources. Piggyback missions will generally follow the process as described here with the obvious exception that the LV SPO will not be directly involved.

3. Ground Rules

a. STP must sponsor any APL requesting a launch opportunity on a DoD EELV mission. The SMC Det 12 DoD Space Test Program is the DoD appointed executive agent for acquiring launch opportunities for all DoD APLs and for all non-DoD APLs seeking launch on DoD launch vehicles. STP will serve as the filter and unbiased broker for determining which programs may take advantage of EELV APL launch opportunities (see "3. STP Sponsorship" below).

b. The APL must not induce unreasonable cost, schedule, or performance risk to the primary payload or its mission. Should such risks arise at any time, the primary payload may request that an APL be removed from the payload stack. As a result and to preserve the integrity of the planned mission profile, each APL program must prepare a mass simulator at the start of the mission integration cycle as a contingency for the primary payload. An alternative is to fly another APL as identified by STP that is similar to the original APL in dimension, mass, and services required. This may require parallel integration, but ensures that excess capacity is fully utilized.

c. The APL should not adversely impact the primary payload. For most configurations, the APL will only affect the primary payload by raising the primary payload within the launch vehicle fairing. The EELV Standard Interface Plane (SIP) and EELV Standard Electric Interface Panel (SEIP) may be duplicated at other points in the payload stack, but must be certified by the Launch Vehicle Contractor (referred to as "LVC" hereafter). This will ensure that launch service standards are consistent at any primary payload interface. To further ensure consistency, there may be no APL interaction or splice between the primary payload and the EELV Standard Electrical Interface Panel (SEIP). This rule may be waived if agreed upon by both the primary payload and launch vehicle contractor.

d. The primary payload will determine the mission profile, flight trajectory, and payload deployment sequence.

e. The APL must provide flight certification recommendation to SMC/CC. Furthermore, all elements of the APL are subject to review and approval by the SMC Independent Readiness Review Team (IRRT).

f. The APL must not violate the flight opportunity constraints as defined in the manifest package. Such violation could be considered grounds for de-manifesting.

g. During the execution of Rideshare missions under this implementation plan, all safety issues will be identified and thoroughly addressed in accordance with all applicable DoD safety policy directives and guidelines.

4. Mission Initiation and Manifesting Process

a. STP has been designated as the "front door" for all DoD APLs, regardless of launch opportunity (i.e. DoD, NASA, or Commercial launch) and for all non-DoD APLs seeking launch opportunities on DoD missions. In this capacity, STP will help foster relationships between appropriate primary and APLs. EELV and the primary System Program Offices (SPO) will maintain a database of available excess capability on all EELV missions and will make this available to STP for APL mission design.

b. STP sponsorship of APLs will be determined by a manifesting process refined over the past 35+ years of flying DoD Space Experiment Review Board (SERB) experiments. This process begins with the APL program documenting flight requirements and identifying acceptable trade space for such items as orbit, schedule, volume, mass, etc. STP will work with the APL to document and refine requirements to the point that potential launch opportunities can be evaluated. STP will then evaluate these requirements against constraints from available flight opportunities (e.g. excess launch capability, available volume, compatible schedule/orbit, etc). When a suitable launch opportunity has been identified, STP will document that opportunity, roles, responsibilities, and funding requirements in a **Memorandum of Agreement (MOA)**. Furthermore, STP will compose a **Mission Requirements Document (MRD)** that identifies the projected launch date, orbit, primary payload, and any other top-level mission elements or constraints. Both the draft MOA and MRD then represent a tentative flight opportunity offer on a DoD EELV and will be submitted to the APL project office.

c. After APL program acceptance of the MOA and MRD, both documents will be presented to EELV and the primary payload program for preliminary approval and consideration. Following preliminary approval by the affected programs, STP will coordinate development of the following technical and programmatic documents between the parties.

(1) **Technical Requirements Document (TRD)** – Defines requirements between the APL and the launch vehicle as well as required testing standards and constraints levied by the primary payload.

(2) **Concept of Operations (CONOPS)** – Defines space flight operations, as well as associated roles and responsibilities.

(3) **Preliminary Mission Risk White Paper (MRWP)** – Identifies potential risk areas.

d. These five completed documents (MOA, MRD, TRD, CONOPS, and MRWP) form the basis for a **Space Flight Plan (SFP) package**. The SFP – when approved by the APL program, the primary payload program, and EELV – will grant technical approval and authority to proceed with special studies and engineering designs (although studies may be conducted prior to a final SFP in order to assess feasibility). STP will then coordinate the SFP with HQ AFSPC/XO for operational requirements, impacts, and operational approval. HQ AFSPC/XO retains the right to disapprove any APL based upon adverse operational impacts regardless of its technical feasibility. When the SFP is signed by both SMC/CC and HQ AFSPC/XO, the APL will be considered officially manifested on the subject launch.

5. Feasibility Studies, Requirements Definition, and the Mission Integration Timeline

Upon acceptance of the preliminary SFP package, EELV shall initiate an incremental feasibility study, funded by the APL program, to determine if the APL coupled with the primary payload can be launched without unacceptable adverse impact to the primary mission. Feasibility study results will be presented to the EELV, STP, LVC, auxiliary, and primary payload system program directors (SPDs). Following this presentation, SPDs will validate the feasibility of the APL and grant authority to further proceed with the mission. The study will provide an evaluation of technical risks, capabilities, limitations, and other implications associated with the proposed mission. The study will help define a flight profile and refine the concept of operations

of the APL as it relates to the LV and the primary payload. Furthermore, the study will identify mission unique hardware and service requirements that are above and beyond the EELV standard launch service. The study will request Rough Order of Magnitude (ROM) estimates for these unique requirements and an estimated implementation timeline.

6. Funding

At a minimum, the APL program will be expected to fully fund all mission unique requirements associated with or as a result of incorporating the APL onto the mission. These costs include, but are not limited to, the aforementioned feasibility study; mission integration special studies; the design, fabrication, and certification of mission unique hardware to include a contingency mass simulator; and any additional costs of integrating the APL. The APL will also be expected to fully fund all costs attributed to additional launch range support, schedule delays, regression testing or any other cost incurred by the primary payload program office due to the APL activity. For those APLs approved by the Space Experiments Review Board (SERB), STP may partially or fully fund these activites. The EELV Program will assist space vehicle customers to define requirements, establish budgets for, and execute all contracts related to launch service.

7. Roles & Responsibilities

a. STP

(1) STP shall receive and coordinate all APL flight requests.

(2) STP shall screen all APL flight requests against potential flight opportunities and shall propose suitable matches for the APL program to consider.

(3) STP shall generate and coordinate the APL program's APL Manifest package

(4) After a potential flight opportunity has been accepted by the APL, STP shall coordinate the proposed SFP package with EELV and the primary payload program for tentative approval (pending further technical evaluation).

(5) STP shall lead the APL program in development of the required manifesting documents.

(6) STP shall coordinate and staff the SFP package through SMC/CC and HQ AFSPC/XO.

b. EELV

(1) EELV shall maintain a database of available capability on all planned launches. As needed, this information will be transmitted to STP to facilitate their role as broker between primary and APLs.

(2) EELV shall refer all APL inquiries to STP for coordination and screening.

(3) EELV shall support STP with technical and programmatic inputs to facilitate the manifesting process.

(4) EELV shall negotiate and execute all contracts for launch vehicle related tasks including technical feasibility studies, unique hardware production, mission integration analyses, etc. As part of this effort, EELV shall help auxiliary and primary payloads define and compose contract statements of objectives and be the sole conduit for contractual communication with the EELV LVC.

(5) EELV shall acquire all payload integration services, acquire all associated mission unique hardware/software, manage the launch vehicle integration process, and manage the payload stack-to-launch vehicle, integration activities.

(6) EELV shall be responsible for the implementation of effective strategies for mission assurance and risk reduction for the launch vehicle stack as a whole and ensure LVC concurrence with all flight hardware certification.

c. Primary Payload

(1) The Primary Payload shall work with EELV and their Launch Vehicle Contractor to determine available APL mass and volume envelopes for their mission(s) and provide updates to this information for the EELV database as required.

(2) The Primary Payload shall refer all APL inquiries to STP for coordination and screening.

(3) To ensure consistent treatment and opportunities for APLs, the Primary Payload shall not arrange bilateral technical interface agreements with an APL. Primary Payloads are encouraged to support the technical and programmatic ground rules levied by STP and EELV.

(4) The Primary Payload shall review preliminary proposed mission plans in a timely manner and provide concurrence to proceed with detailed mission planning.

(5) The Primary Payload shall provide STP with timely inputs to the manifesting documents.

(6) The Primary Payload shall provide timely primary payload inputs required for feasibility studies, and advanced mission integration analysis.

(7) The Primary Payload shall ensure effective strategies are implemented for mission assurance and risk reduction of the primary payload.

(8) The Primary Payload shall concur with the mission profile, flight trajectory, and approve the payload deployment sequence.

(9) The Primary Payload shall review and concur with APL flight hardware certification.

(10) The Primary Payload is the sole conduit for contractual communication with the primary space vehicle contractor (SVC).

d. Auxiliary Payload(s)

(1) The APL shall prepare and submit all components of the APL Manifest as required by STP, including updates as required.

(2) The APL shall prepare and submit a mission assurance and risk reduction/mitigation plan.

(3) The APL shall comply with all technical and programmatic directives levied by STP, EELV, and the primary payload program office as applicable.

(4) The APL shall provide a mass simulator at the start of the mission integration cycle to serve as a backup in case the flight payload cannot be delivered on schedule.

(5) The APL shall provide flight readiness certification of their flight hardware and shall participate in all SMC readiness reviews, as required.

e. Independent Readiness Review Team (IRRT)

(1) To ensure overall mission assurance, the IRRT shall provide the SMC/CC an independent assessment of all launch vehicle and space vehicle program feasibility study results, flight hardware certification, risk reduction methods, and mission assurance and integration activities.

(2) The IRRT shall review and participate in all EELV activities to include APL accommodation and integration as required and appropriate.

8. Point of Contact

To initiate the process for flying an Auxiliary Payload on a DoD EELV launch, contact:
DoD Space Test Program
Spaceflight Mission Design Division
SMC Det 12/STX
DSN: 246-8820
Comm: (505) 846-8820
E-mail: dodstp.rideshare@kirtland.af.mil

BRIAN A. ARNOLD
Lieutenant General, USAF
Commander

2 Atch
1. Distribution List
2. APL Process Flowchart

DISTRIBUTION:

SMC Det 12/CC
SMC Det 12/ST
SMC Det 12/RP
SMC Det 12/VO
SMC/EV
SMC/WX
SMC/MC
SMC/SB
SMC/SY
SMC/IS
SMC/TD
SMC/DSP
SMC/GP
AFSPC/XO
AFSPC/DR
AFSPC/XP
SAF/USAL
SMDC-RD-TC-MT-Y
NNSOC
NRO/OSO
NRL
AFRL/XPS

ATTACHMENT 1

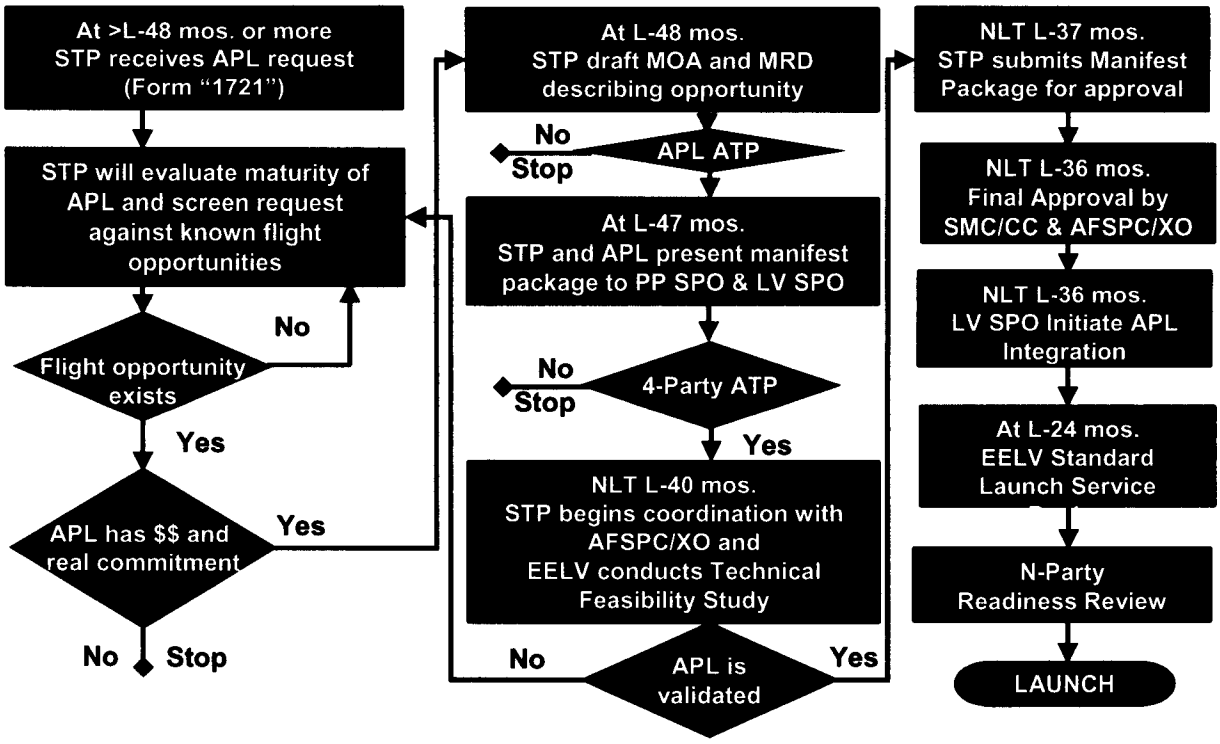

Figure: STP's EELV APL Manifest Process Flowchart

ATTACHMENT 2